

REMARKS/ARGUMENTS

Claims 15 to 24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over either U.S. Patent No. 3,552,886 to Olson or U.S. Pub. No. 2002/0039531 to Morita et al. in view of U.S. Pub. No. 2002/0129603 to Schorr et al. Claims 25 to 31 were objected to as being dependent upon a rejected base claim.

Reconsideration of the application is respectfully requested.

35 U.S.C. 103 Rejections

Claims 15 to 24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over either U.S. Patent No. 3,552,886 to Olson or U.S. Pub. No. 2002/0039531 to Morita et al. in view of U.S. Pub. No. 2002/0129603 to Schorr et al.

Olson shows a compressor unit with self-contained drive means. Figure 1 of Olson shows “a housing 10 with a main smooth bore bounded by a series of internal threads 11 around an annular surface at one end and by an inturned flange 12 at the opposite end” (col. 3, lines 15 to 18 of Olson). “The internal threads 11 mate with the external threads 13 formed in an annular retaining ring 14, which, when threaded into the housing end, may compress an O-ring 15 tightly against the outturned annular shoulder 16 of an end bell 17” (col. 3, lines 18 to 23 of Olson).

Morita et al. shows a “refrigerant compressor [that] includes a cylinder block, a front housing, and a sealing member” (Abstract of Morita et al.). “In compressor 100, front housing 6 and cylinder block 1 are joined by engaging external thread 6a of front housing 6 with internal thread 1b of cylinder block 1” (Specification at [0021] of Morita et al.). “The joint portion between external thread 6a and internal thread 1b is sealed by O-ring 10” (id.). “The strength of the joint portion between front housing 6 and cylinder block 1 may be increased by adjusting a height of the thread, a pitch of the thread, the number of threads of external thread 6a and internal thread 1b, or combination thereof” (id.).

Schorr et al. shows a device to reduce vibrations in a hydraulic force transfer system. “[A] design is preferred according to which the cover is attached to the housing by means of a threaded connection” (Specification at [0016] of Schorr et al.). “Such a threaded connection firstly allows easy replacement of the membrane” (id.). “The threaded connection is preferably structured as both a sawtooth and a round thread” (Specification at [0017] of Schorr et al.). In addition the threaded connection described above has advantages in that due to the sawtooth thread-like structure on the internal diameter of the thread profile on the housing a greater thread bearing depth can be achieved than with a conventional trapezoid thread, whereas the round thread-like structure on the external diameter of the thread profile on the housing ensures a reduction in notch effect in comparison with conventional trapezoid thread, which is particularly important for the durability of the housing when plastic is used as a housing material” (id.).

Claim 15 recites “a reciprocating piston-type machine, comprising:
a housing;
a housing cover;
a power unit disposed in the housing and including a plurality of pistons;
one of a suction and discharge area and a forward shaft bearing disposed in the housing cover; and
a screw connection configured to screw-couple the housing cover to the housing, the screw connection including saw tooth thread between the housing and the housing cover.”

As admitted in the Office Action, neither Olson nor Morita et al. shows a “sawtooth thread” as recited in claim 15. Morita discloses generic teeth. It is clear to one skilled in the art that Morita is speaking of conventional teeth and not specifically saw teeth. Furthermore, Morita et al. asks for “increasing a height (depth) of a thread, to increase joint strength.” This teaches away from saw teeth as changing the shape of teeth does not strengthen the housing, and it is respectfully submitted that it would not have been obvious to combine.

But even if it would have been prima facie obvious to combine/ modify Morita (which it is not) this prima facie case of obviousness can be rebutted by secondary considerations. See MPEP 2141.

Saw teeth threadings have been known for a long time for use in thermal fluid devices (See U.S. Patent Nos. 2,424,738 and 3,450,298), as have compressors (See U.S. Pat. No. 3,552,886) as the Examiner has admitted. This is objective evidence that no one until the present invention was able to solve the long felt problem of increased joint strength in compressors by using saw teeth as claimed. Thus, it is respectfully submitted that any prima facie case of non-obviousness has been rebutted.

Withdrawal of the rejection to claims 15 to 24 is respectfully requested.

Claim Objections

Claims 25 to 31 were objected to as being dependent upon a rejected base claim but were indicated as being allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In light of the above with respect to claim 15, withdrawal of the objection to claims 25 to 31, which depend from claim 15, is respectfully requested.

References

U. S. Patent Nos. 2,424,738 and 3,450,298 have been mentioned above as references to the argument that saw teeth have been known for use in thermal fluid devices for a long time. These are cumulative references and are not intended for disclosure under 37 C.F.R. §1.98.

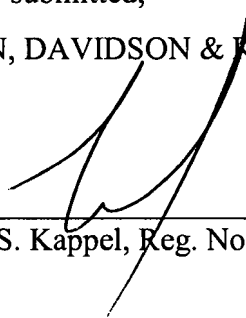
CONCLUSION

The present application is respectfully submitted as being in condition for allowance and applicants respectfully request such action.

Respectfully submitted,

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By


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